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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/936,611	09/14/2001	Takuya Nakashima	L7016.01127	7319

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EXAMINER

CREPEAU, JONATHAN

ART UNIT PAPER NUMBER

1746

DATE MAILED: 08/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/936,611

Applicant(s)

NAKASHIMA ET AL.

Examiner

Jonathan S. Crepeau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 June 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5-7 and 9-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,5-7,9 and 11-14 is/are rejected.
- 7) ☒ Claim(s) 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. This Office action addresses claims 1, 5-7, and 9-14. Claims 7, 13, and 14 remain rejected over JP 4-132174, as these claims still recite a calcium compound. Further, claims 1, 5-7, 9, and 11-14 are newly rejected under 35 USC 102 and 103, as necessitated by amendment. Claim 10 contains allowable subject matter. Accordingly, this action is made final.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 7, 13, and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Fujimoto et al (U.S. Patent 6,132,903).

The reference is directed to a non-aqueous electrolyte secondary battery. The positive electrode comprises a lithium manganese oxide (see col. 3, line 4). The negative electrode contains B₂O₃, natural graphite and one of SrO, Na₂O, or K₂O (see col. 3, line 67; Table 2). The

negative electrode is made by a mixing and slurry formation process (see col. 3, line 65). Thus, the instant claims are anticipated.

Claim Rejections - 35 USC § 103

4. Claims 1, 9, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimoto et al.

The reference is applied as stated above. Further, regarding claim 1, the negative electrode mix comprises 90 weight parts glass powder and 5 weight parts graphite, wherein the glass powder is made of a 2:1 molar ratio of boron oxide and the Sr, Na, or K oxide (see Experiments 1 and 2). However, the reference does not expressly teach the weight percentages of sodium, potassium or strontium as recited in claim 1, or that the Sr, Na, or K oxides may have a stoichiometric formula (e.g., Na_2O_2 , K_2O_2 , etc.) other than those disclosed by the reference.

However, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be sufficiently skilled to adjust the molar (weight) percentage of sodium, potassium, or strontium oxide in the negative electrode mixture so as to affect the resulting properties of the electrode. Table 2 discloses the discharge capacity and capacity maintenance of the exemplary batteries of the invention. It would be well within the skill of the art to incorporate varying amounts of modifier oxide (i.e., Na, K, Sr) in the negative electrode to affect these properties. Additionally, the recitation of oxides of differing stoichiometries (e.g., Na_2O_2 , K_2O_2) is also not considered to distinguish over

the reference. Such oxides could reasonably be expected to have similar properties to the oxides employed by Fujimoto. As such, it would be obvious to use oxides of varying stoichiometries in the negative electrode of Fujimoto.

5. Claims 7, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 4-132174.

The reference teaches a non-aqueous electrolyte secondary battery (see abstract). The positive electrode comprises manganese oxide (see abstract), which becomes a lithium manganese composite oxide during cycling of the battery. The negative electrode contains a carbonaceous material (coal-type pitch coke) capable of occluding and releasing lithium ions (see page 7, line 5 of translation). The negative electrode further contains a carbide of calcium (see pages 8 and 9 of the translation).

The reference does not appear to teach that the negative electrode is made by mixing the calcium compound and the carbonaceous active material and forming a slurry, as recited in claim 7.

However, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because casting methods which involve slurry formation are efficient and inexpensive ways of forming electrode mixtures. As such, the artisan would be motivated to form the negative electrode of JP '174 by forming a slurry.

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6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimoto as applied to claims 1, 9, 11, and 12 above, and further in view of Iwata et al (U.S. Patent 6,168,888).

Fujimoto does not expressly teach that the lithium manganese oxide is a cubic material possessing the properties recited in instant claim 5.

Iwata et al. is directed to a cubic spinel-type lithium manganese oxide containing heteroelements (see abstract). In column 2, line 48, the reference teaches that the lattice constant is between 8.19 and 8.24 angstroms. In column 2, line 63, the reference teaches that the average particle diameter is 1-50 microns and the BET surface area is 0.1-5 m²/g.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the lithium manganese oxide of Iwata et al. in the battery of Fujimoto. In column 1, line 51, Iwata et al. teach the following:

It is an object of the present invention to provide a high-performance spinel-type lithium-manganese oxide for use as a material for positive electrodes of a Li secondary battery with inhibited Mn dissolution in an organic electrolyte, as well as a high-performance lithium secondary battery using said lithium-manganese oxide as a positive electrode.

As such, the artisan would be motivated to use the lithium manganese oxide of Iwata et al. in the battery of Fujimoto, thereby rendering the subject matter of claim 5 obvious.

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7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimoto as applied to claims 1, 9, 11, and 12 above, and further in view of Wang et al (U.S. Patent 5,532,084).

Fujimoto does not expressly teach that the lithium manganese oxide is a rhombic system material possessing the properties recited in instant claim 6.

Wang et al. is directed to a manganese dioxide product (see abstract). In column 4, line 32, the reference teaches that the manganese dioxide is orthorhombic with lattice constants of 4.5, 9.28, and 2.87 angstroms.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the manganese dioxide of Wang et al. in the battery of Fujimoto. In column 2, line 23, Wang et al. teach the following:

new name) in the figures and description herein. The P-CMD product of the invention when used as cathode active material in electrochemical cells, particularly alkaline and lithium cells, provides these cells with higher capacity and energy density per gram than are obtainable from the same cells employing conventional chemical manganese dioxide (CMD) or electrolytic manganese dioxide (EMD). Additionally, the discharge voltage profiles of cells, particularly lithium cells, containing the P-CMD as cathode active material, are higher than in conventional cells employing EMD or CMD cathode material. This is very attractive in that the use of P-CMD as cathode material can result in a higher power cell. The P-CMD product is characterized by

Accordingly, the artisan would be motivated to use the manganese oxide of Wang et al. in the battery of Fujimoto, thereby rendering the claimed lattice constants obvious. Furthermore, the artisan would be sufficiently skilled to manipulate the average diameter and surface area of the manganese dioxide so as to fall within the claimed ranges. These parameters are known to affect

the resulting electrochemical properties of an active material. It has been held that the discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980).

Allowable Subject Matter

8. Claim 10 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter:

Claim 10 recites various compounds of sodium, potassium, and strontium. Fujimoto and JP '174, the closest prior art, do not teach or fairly suggest these compounds. Furthermore, Cho et al (U.S. Patent 6,372,386) is made of record because it teaches alkali hydrogencarbonate compounds, but it fails to qualify as prior art because it does not antedate applicant's foreign priority date.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

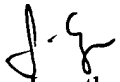
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr, can be reached at (571) 272-1414. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

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may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jonathan Crepeau
Primary Examiner
Art Unit 1746
August 17, 2005